Operating Instructions

Hot Runner Control Cabinets

Series HRS

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Chapter 1

General hints and information

… On this operating and installation manual

This installation and operating manual is valid for all units of the HRS product series. The operating units are equipped with the ETR 132 microprocessor temperature operator. This manual is valid for operating units with and without heating circuit –control. Instructions pertaining to operating units with heating circuit control may be disregarded when employing operating units without the heating circuit control function.

Proviso clause

This manual was composed bearing the entitlement to the latest information, completeness, and accuracy. Further technical development may result in alteration of the equipment or the software, which may cause incompatibility with this manual.

Due to this reason, we are not liable for any interruptions or deficiencies or any subsequent damages created by this circumstance.

This operator's manual is updated with any technical modification. The manual's version number is updated after any adjustments. The version number is printed on the cover of this manual. If you are not holding the latest version, simply contact us and we will send it to you.

Shipment / Scope of shipment / Storage

The operation and display unit is shipped fully assembled in a shockproof, cushioned carton box. Under normal circumstances, this provides sufficient protection.

If damages are visible prior to opening the carton box, the unit should be checked for any signs of damaging. To evaluate the damaging do not install and / or operate the unit. Contact the supplier immediately!

Scope of shipment

Aside from the operation and display unit itself, this shipment includes

- **This installation and operating manual.**

Storage

If the unpacked operation and display unit is not put in use immediately it must be stored in a dirt- and humidity protected environment. The permitted temperature range is -10...60˚C.

Clear identification of the operating unit by the identification tag

An identification tag is fixed on the casing of the operating unit. Information on the identification tag states the condition of the unit at the manufacturer as well as the manufacturing date.

The unit's manufacturing date (month/year) and the exact description of the unit, clearly expressed, are stated in addition to the exact product number.

To ensure quick handling of potential queries, please provide device and serial number.

Precautionary measures

- Read this manual thoroughly prior to installing and / or operating the nit.
- Connecting wiring and power lines may only be conducted by authorized personnel and must be in accordance with this manual.
- Only authorized personnel may operate the unit !
- Maximum voltage may not be exceeded !
- The operation and display unit may not be used in an explosives' area !
- If any interruptions occur, the device should always be sent to the supplier . Should you decide to go trouble-shooting yourself, make sure all power lines are disconnected !

Not following these safety measures and the hints stated in chapter 3 „Installation and First-time Operation" may result in failure of the operation and display unit, the control unit, or in disruption of production. Damages resulting thereof are excluded from the manufacturer's guarantee.

Characteristics – Equipment

All HRS operating units are equipped identically with the following functions and equipment.

- Temperature operating block based on a micro-processor temperature operator with multi-channel technology
- Unanimous operating of up to 32 zones
- State of the art adaptive, self-optimizing operating procedures
- Heating circuit monitoring
- Monitoring functions for sensors, temperature limits and voltages
- Start up function for careful heating in the initiation process
- Start up function with choke function for accelerated heating of tools
- Automatic temperature ramp for equal heating of tools
- Manual mode when sensor broken – with automatic adoption of the most recently computed degree of operation average
- Zone co-use (allocation of a lead-zone) when sensor broken
- 2^{nd} set-point (stand by mode) and 3^{rd} set-point (choke function) manually through switch or optionally through machinery operator

- Recipe function to save up to 4 set-points
- Automatic disconnection of load when exceeding maximum set-point or when identifying electrical power when signal heating OFF from controller.

Chapter 2

Instructions

Press key.
The value of the selected parameter will be shown in the respective zone displays..

Select one or several zones.

Enter input,
Select input mode

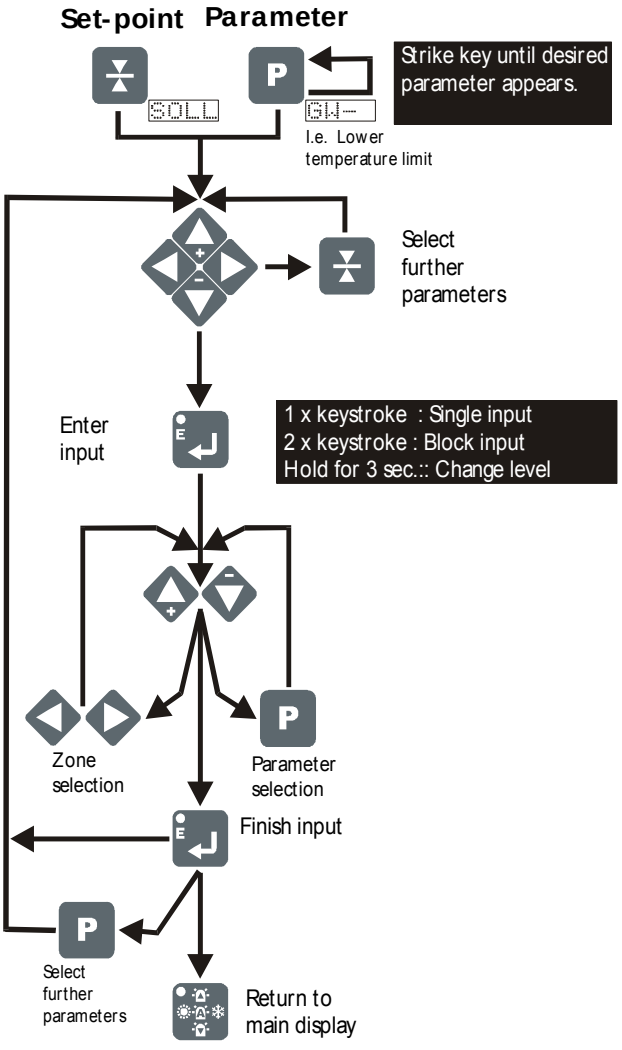
Change value

Select next zone (only possible if single input mode)

Confirm change, finish input

Select next parameter

Return to actual value / deviation display



Chapter

Operating the Unit

The following chapter describes all operating functions in easy-to-read flow charts.

3.1 The Basics

Unanimous Input Sequences

When designing the concept of the Operation- and Display Unit the main focus was put on an easily understandable, well visible, and a self-explanatory operating philosophy.

Hotkeys

Individual hotkeys are assigned to set-point, power parameter, and degree of operation functions. The most important pieces of information are accessible by a single keystroke.

A	Voltage
%	Degree of Operation
	Set-point

To ensure an easy operating, combined functions are initiated by a „common-sense-approach“. For instance, to display power set-points the respective hotkeys are A and (“Electricity” + ”Set-point”).

All other configuration parameters are saved in a separate parameter memory.

Status Display

After pushing the respective status key the current status of individual control zones (temperature alarms, voltage alarms, control ports) is displayed in the respective status displays.

	Control zones status

Deviation Display

To gain quick overview over the implementation of programmed parameters, pushing a key allows to switch between actual data display and deviation display.

5 Operational Steps

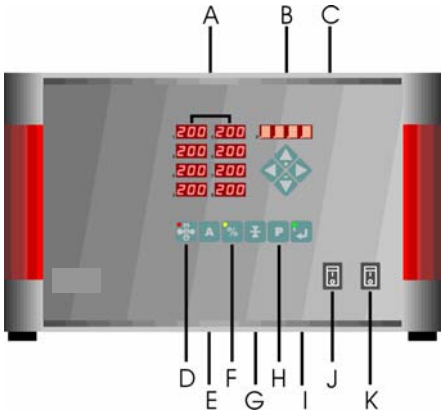
All functions are operated in 5 steps:

- **Select function / configuration parameter**
- **Select zones**
  3 different selections pertaining to zones are available:
  - **single zone**
  - **several selected zones (selective block mode)**
  - **selection of all zones (total block mode)**
- **Enter Input**
  If several zones are selected (selective block mode or total block mode) the data of these zones can be altered by the same absolute or

to the same value. I.e. by applying this method set-point changes for an entire level can be adjusted quite easily.

- **Execute change**
- **Confirm change / finish or continue input.**

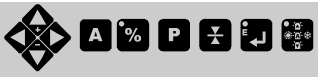
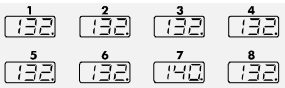
3.2 Operation- and Display elements



A	Zone displays
B	Information display
C	Cursor keys
D	Status key / Back-up key
E	Power key
F	Degree of Operation key
G	Set-point key
H	Parameter key
I	Edit key / Enter key
J	Switch 2nd Set-point 3rd Set-point
K	Power switch

3.2.1 Symbol Codes in the Operating Examples

The definitions are valid for the following operating examples.

	Keys of the Operation and Display Unit
	Zone displays (the order of zones was altered for the purpose of a more applicable presentation.)
	Information display

	Rapidly flashing zone display – shows the position of the cursor.
	Slowly blinking zone display – zone was selected.
	Display-reading in the information display after a certain key was pushed.

3.3 Display readings and their Meanings

Aside from actual temperature or operating values, further information on the status of the operating zone or the operating unit can be shown in the zone displays. These display-readings are as shown in the chart below.

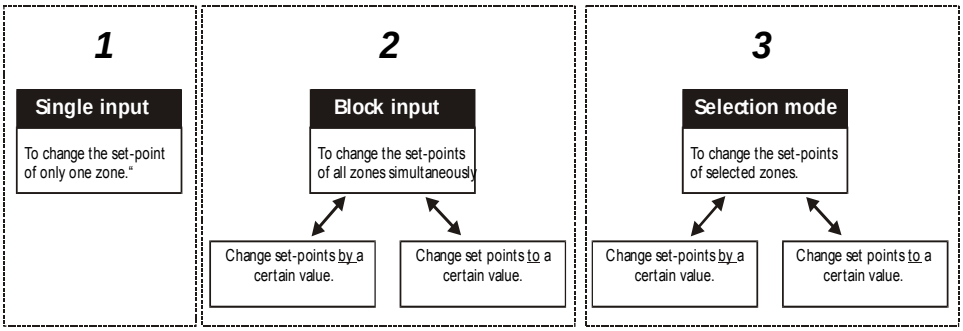
Meaning	Display
Input operations	Stb
Zone providing lead-data	FSb
Zone undergoing lowering process	AbS
Temperature ramp active	rAP
Start up operations active	AFb
Identification active	id
Cooling adaptation active	id-
Sensor fractured	Fb
Sensor short	FAL
Sensor wrongfully connected	FP
Error in the Operation Unit – display data link	CAn
Data error in channel data	Err
Violation of maximum temperature / upper measuring limit	AL
Violation of plausibility during identification process	Pid
Error message „Drift“ during identification process	dri
Error message „No heating current measured“ during identif. proc.	iF
2nd Set-point	So2
3rd Set-point	So3
4th Set-point	So4
Error „no power“ occurred during diagnosis / Error „sensor wrongfully connected“ detected	dF1
Error "wrong zone under power" occurred during diagnosis / Error "temperature increase in a zone" occurred	dF2
Error „power in an appropriate as well as in another zone“ occurred during diagnosis / Error „temperature increase“ occurred.	dF3
No error detected during diagnosis	dE
Diagnosis in progress	diA
Error „Power alarm while heating device turned off“ occurred during diagnosis / Error „Increase in actual value although heating device is turned off“ occurred "	dF4
Automatic ramp active	Ar
Automatic ramp active, zone currently the slowest zone	Ar.
Power alarm active although heating device is turned off	i-
Saving alarm-function active	ALS
Automatic cooling adaptation initiated but not in progress yet	idS

3.4 Operating Functions

Some rather convenient input possibilities are available on the Operation- and Display Unit. How to use them will be shown in the example „Changing set-point parameters“.

Operating Examples The following operating examples are identical with different configuration parameter changes.

The following three input options are available:


1
Single input
To change the set-point of only one zone.“
2
Block input
To change the set-points of all zones simultaneously
Change set-points by a certain value.
Change set points to a certain value.
3
Selection mode
To change the set-points of selected zones.
Change set-points by a certain value.
Change set points to a certain value.

Option 1 The parameter of only one zone is changed.

Option 2 The parameters of all zones are changed simultaneously. In addition, it may be determined whether the parameter is to be changed by or to a certain value.

Option 3 The parameters of certain selected zones are changed simultaneously. In addition, it may be determined whether the parameter is to be changed by or to a certain value.

3.5 Manufacturer’s settings

Set-point	000	°C
Start up function	on	
Start up time	15	Min
2nd Set-point (lowering)	100	°C
3rd Set-point (for boost function)	000	°C
Start up time 3 (for boost function)	005	°C
Start up time 4 (for diagnosis function)	002.	Min
Temperature limits	005	°C
Heater current tolerance	20	%
Manual mode	oFF	
Automatic temperature ramp	oFF	

Set-point data input is limited to 450 °C. If actual data exceeds maximum set-point data by by > 5 °C a Lastabschaltung will occur automatically. This is to prevent an uncontrolled heating under broken operator conditions.

The operator in a device with an integrated heating circuit monitor will recognize the heating of a zone – once there is still electricity – although there are no more heating impulses generated by the operator.

3.6 Basic functions of the operating unit

3.6.1 Start up function

A start up function is used for careful heating (to purge humidity). This function operates the connected operating zone to a set-point of 100°C for a pre-set start up time frame. Upon completion of the start up cycle the operator goes to the final set-point. This always occurs automatically – presuming the start up function is initiated and conditions for start up functions are set – after turning on the operating block.

Conditions :

- **after turning on the operating block**
- **Start up function on**
- **Start up time >0 minutes**
- **Set-point>100 °C**
- **Actual temperature < 70 °C**

Parameters for the start up function are saved in the parameter memory

ANFB activate/deactivate start up function, ANFZ start up time 0...99 minutes

3.6.2 Start up operation with boost function

For faster heating of tools when starting, if the employed materials permit, start up with an increased temperature set-point is possible for a pre set time. The choke function can be activated manually, through a switch on the operating block, or automatically by programming a time frame.

This automatic function is coupled with the start up function. Upon completion of the start up cycle the operator automatically goes to the boost set-point.

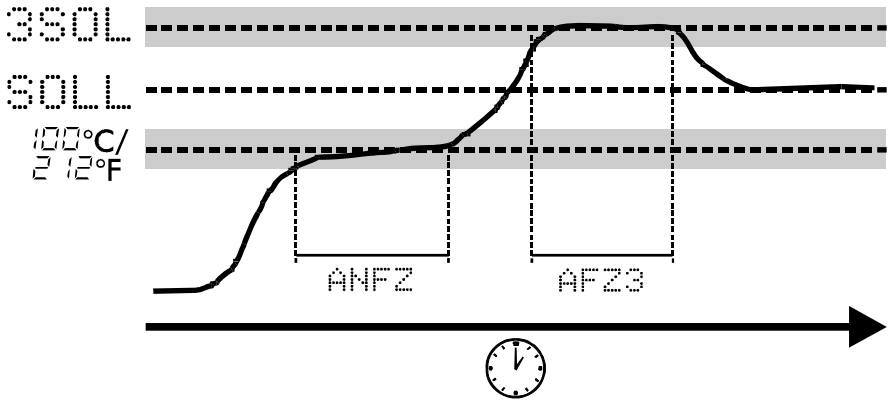
Operating :

- **after turning on operating block**
- **start up function activated**
- **3rd set-point > 0 °C**
- **start up time of boost set point > 0 minutes**

Parameters for the choke function are saved in the parameter memory.

3SOL 3rd set-point (set-point for boost function)

AFZ3 Start up time 3 (time frame for active choke function)



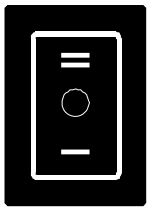
3.6.3 2nd Set-point function (standby mode) 3rd Set-point function (boost function)

Aside from the main set-point two additional set-points are accesible by switch through the standard operating block. These additional set-points are activated through a switch on the front dashboard on the operating block. Three positions are available on the switch:

- **lower position: 2nd set-point (lowering)**
- **middle position: main set-point**
- **upper position : 3rd set-point (boost)**

Both additional set-points are freely adjustable as absolute values in the parameter memory. Set-point 3 is defined in conjunction with start up time 3 for the automatic boost function (increased set-point). Set-point 2 should be used as the lowering set-point. For information purposes a display information 2So for set-point 2 and 3So for set-point 3, respectively, will appear cyclically in the zone display .

3.6.3.1 Switch to activate additional set-points



- 3rd set-point (boost function)
- middle position
- 2nd set-point (lowering function)

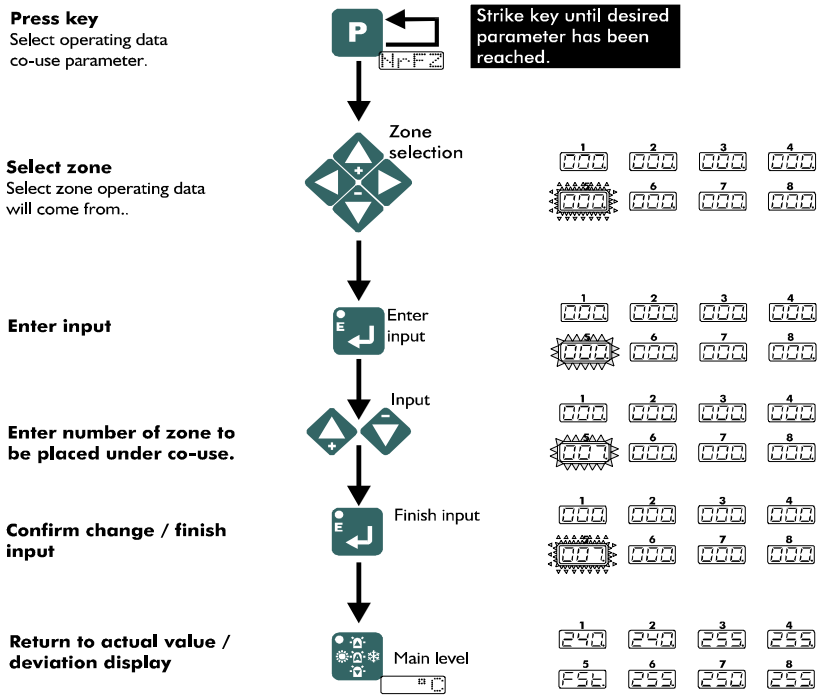
Parameters for the 2nd and 3rd set-point are saved in the parameter memory.

3SOL 3rd set-point (set-point for boost function)

2SOL 2nd set-point (set-point for lowering function)

3.6.4 Zone co-use under broken sensor conditions

In the event of a broken sensor it is possible to co-use operating data coming from a lead zone with the affected zone. It is important to ensure operating data of the designated lead zone is of almost identical with the damaged zone.



3.6.5 Amplified degree of operation for lead zone

If the outgoing degree of operation data from the lead zone is too high or too small to maintain the zone at the desired operating temperature it is possible to increase or decrease the degree of operation manually. This occurs through an optional degree of operation amplification factor in 1% increments, which affects the zone supplying data for zone co-use.

To do so, select the parameter for lead zone amplification K-FZ in the parameter memory as well as the respective zone that a lead zone was allocated to. Enter the desired amplification in %.

Range : -100...100%

- **000%; no amplification**
- **-001… -100%; the degree of operation coming from the lead zone is weakened.**
- **001…100% ; the degree of operation coming from the lead zone is increased.**

3.6.6 Disconnection of load

The operating blocks are equipped with an automatic disconnection of load, which is initiated in the event of an error. The function is triggered when an actual temperature is higher than the maximum set-point, the measuring range of the thermal element is exceeded, or a voltage is measured when the heating is turned off. The sensor range of thermal elements of the FeCuNi type is 499 °C. When exceeding maximum temperatures AL for **T**emperature**A**larm and I – for voltage alarm heating will appear cyclically in the respective zone displays. Since this indicates a possibly defective operating part alarm reports occur in saving mode and must be confirmed. When recognizing a voltage despite turned off heating a voltage alarm message flashes additionally in the status display.

AL temperature alarm

I – Current alarm

Chapter 4

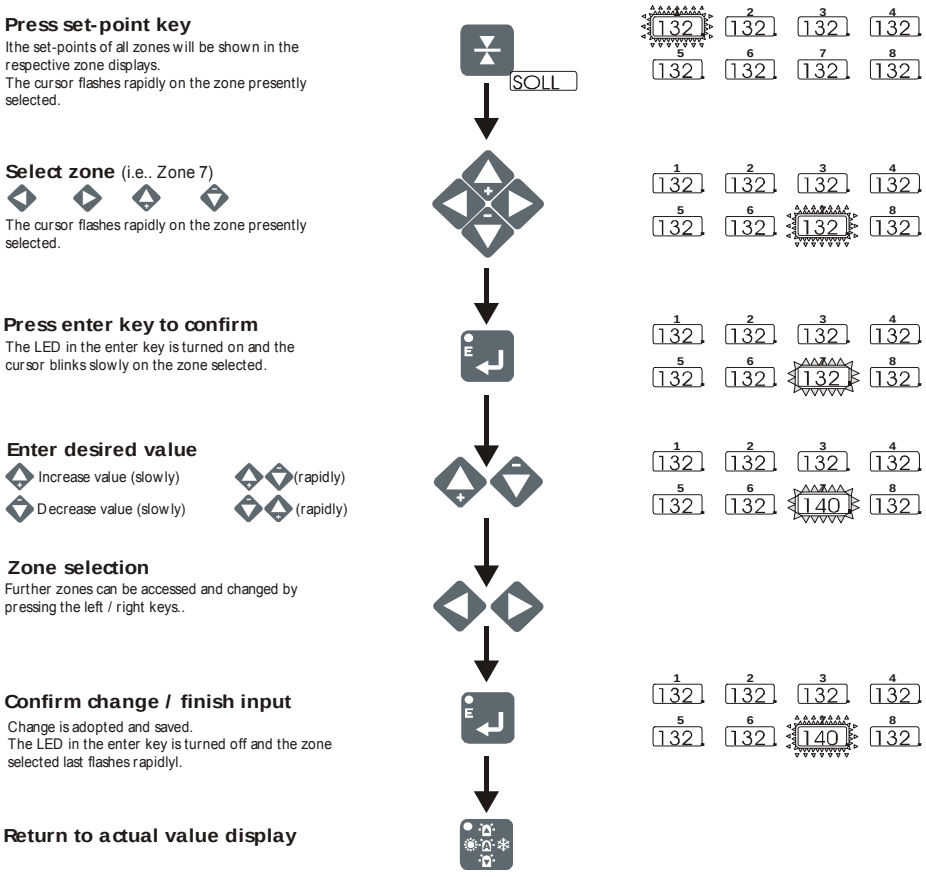
Operating examples

The following chapter describes all operating functions in easily read flow charts.

Change set-point

Single input

The single input option is used when only one set-point is supposed to be changed.


Press set-point key
Ithe set-points of all zones will be shown in the respective zone displays.
The cursor flashes rapidly on the zone presently selected.
SOLL
Select zone (i.e.. Zone 7)
The cursor flashes rapidly on the zone presently selected.
Press enter key to confirm
The LED in the enter key is turned on and the cursor blinks slowly on the zone selected.
Enter desired value
Increase value (slowly)
Decrease value (slowly)
(rapidly)
(rapidly)
Zone selection
Further zones can be accessed and changed by pressing the left / right keys..
Confirm change / finish input
Change is adopted and saved.
The LED in the enter key is turned off and the zone selected last flashes rapidlyl.
Return to actual value display
132
140

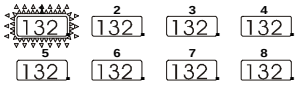
Block mode

Block mode / to set set-points of all zones to one value

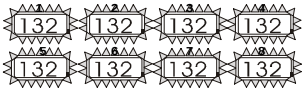
This input option is used when the set-points of all zones are supposed to be increased / lowered to a certain value in one step.

In the following example all set-points are set to 140°C.

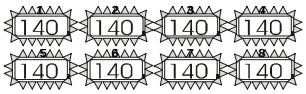
Press set-point key
Ithe set-points of all zones are shown in the respective zone displays.
The cursor flashes rapidly in the zone presently selected.



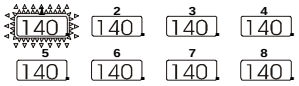
To initiate block input procedures double-click the enter key.
The LED in the enter key is turned on and all zones blink slowly..



Enter desired value
Increase value (slowly)
(rapidly)
Decrease value (slowly)
(rapidly)



Confirm change / finish input
Changes are adopted and saved.
The LED in the enter key is turned off. The zone chosen last flashes rapidly..



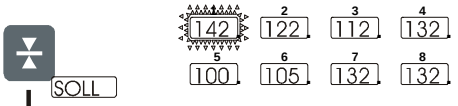
Return to actual value display
(Occurs automatically after 150 seconds if no further key is pushed)

Block mode / Change set-points of all zones by the same value

This input option is particularly convenient when the temperature level of all zones is supposed to be simultaneously increased / decreased by the same value.

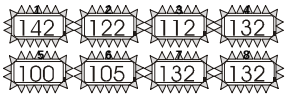
In the following example, the set-points of all zones are increased by 10°C.

Press set-point key
The set-points of all zones are shown in the zone displays..
The cursor flashes rapidly in the zone presently selected.



Hold enter key for about 3 seconds.

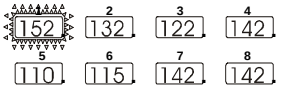
The LED in the enter key is turned on and all zones blink slowly.



Enter desired value

Increase value (slowly) (rapidly)
Decrease value (slowly) (rapidly)

Confirm change / finish input
Changes are adopted and saved.
The LED in the enter key is turned off.
The zone chosen last flashes rapidly.



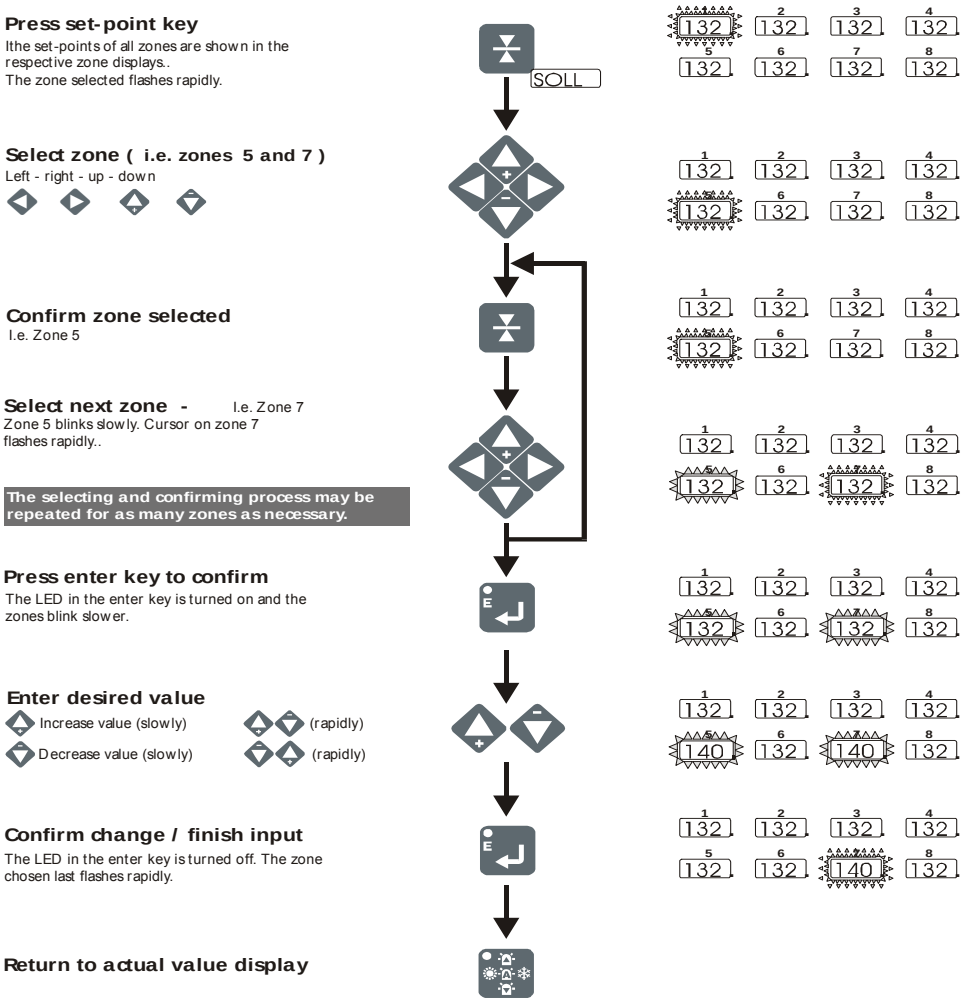
Return to actual value display
(Occurs automatically if no further key is pushed)

Selection mode

Selection mode / Change set-points of selected zones to one value

This input option is especially suitable when the set-points of selected zones are supposed to be increased / decreased to a certain value.

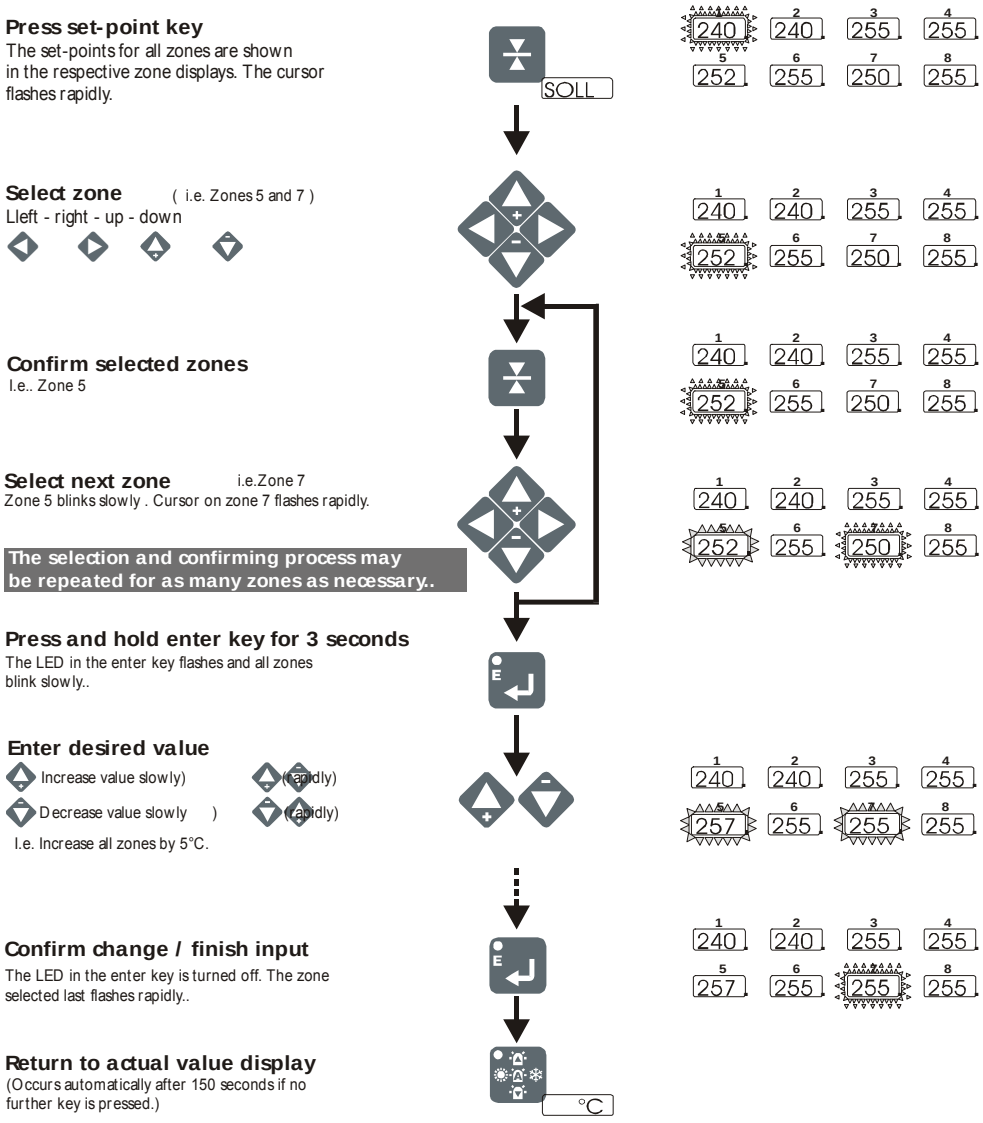
In the following example the set-points of zones 5 and 7 are changed to 140°C.


Press set-point key
Ithe set-points of all zones are shown in the respective zone displays..
The zone selected flashes rapidly.
SOLL
Select zone (i.e. zones 5 and 7)
Left - right - up - down
Confirm zone selected
I.e. Zone 5
Select next zone -
I.e. Zone 7
Zone 5 blinks slowly. Cursor on zone 7 flashes rapidly..
The selecting and confirming process may be repeated for as many zones as necessary.
Press enter key to confirm
The LED in the enter key is turned on and the zones blink slower.
Enter desired value
Increase value (slowly)
(rapidly)
Decrease value (slowly)
(rapidly)
Confirm change / finish input
The LED in the enter key is turned off. The zone chosen last flashes rapidly.
Return to actual value display
132
140

Selection mode /Change set-points of selected zones by the same value

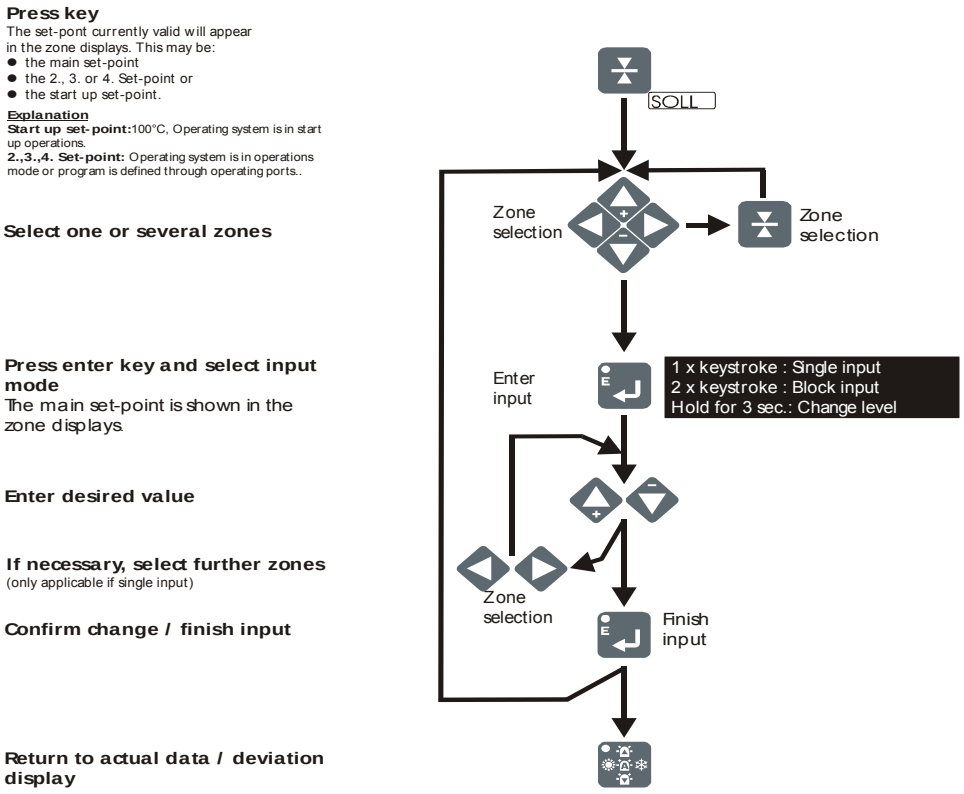
This input option is especially advisable when the set-points of selected zones are supposed to be increased/decreased simultaneously by a certain value.

In the following example the set-points of zones 5 and 7 are increased by 5°C.


Press set-point key
The set-points for all zones are shown in the respective zone displays. The cursor flashes rapidly.
SOLL
Select zone (i.e. Zones 5 and 7)
LIeft - right - up - down
Confirm selected zones
I.e.. Zone 5
Select next zone i.e.Zone 7
Zone 5 blinks slowly . Cursor on zone 7 flashes rapidly.
The selection and confirming process may be repeated for as many zones as necessary..
Press and hold enter key for 3 seconds
The LED in the enter key flashes and all zones blink slowly..
Enter desired value
Increase value slowly)
(rapidly)
Decrease value slowly)
(rapidly)
I.e. Increase all zones by 5°C.
Confirm change / finish input
The LED in the enter key is turned off. The zone selected last flashes rapidly..
Return to actual value display
(Occurs automatically after 150 seconds if no further key is pressed.)
°C
240 240 255 255
252 255 250 255
257 255 255

Summary set-point changes

All examples pertaining to set-point changes given in the preceding chapters can be summarized in one single flow chart.


Press key
The set-pont currently valid will appear in the zone displays. This may be:
● the main set-point
● the 2., 3. or 4. Set-point or
● the start up set-point.
Explanation
Start up set-point:100°C, Operating system is in start up operations.
2.,3.,4. Set-point: Operating system is in operations mode or program is defined through operating ports..
SOLL
Select one or several zones
Zone selection
Zone selection
Press enter key and select input mode
The main set-point is shown in the zone displays.
Enter input
1 x keystroke : Single input
2 x keystroke : Block input
Hold for 3 sec.: Change level
Enter desired value
If necessary, select further zones
(only applicable if single input)
Zone selection
Confirm change / finish input
Finish input
Return to actual data / deviation display

Set-points in the operating system

Aside from the "normal" set-point (main set-point) there are additional set-points in the operating block that may be active due to processor conditions (i.e. start up or programming mode) or due to outside influences (i.e. digital ports engaged) coming from the operator.

Among the additional set-points are:

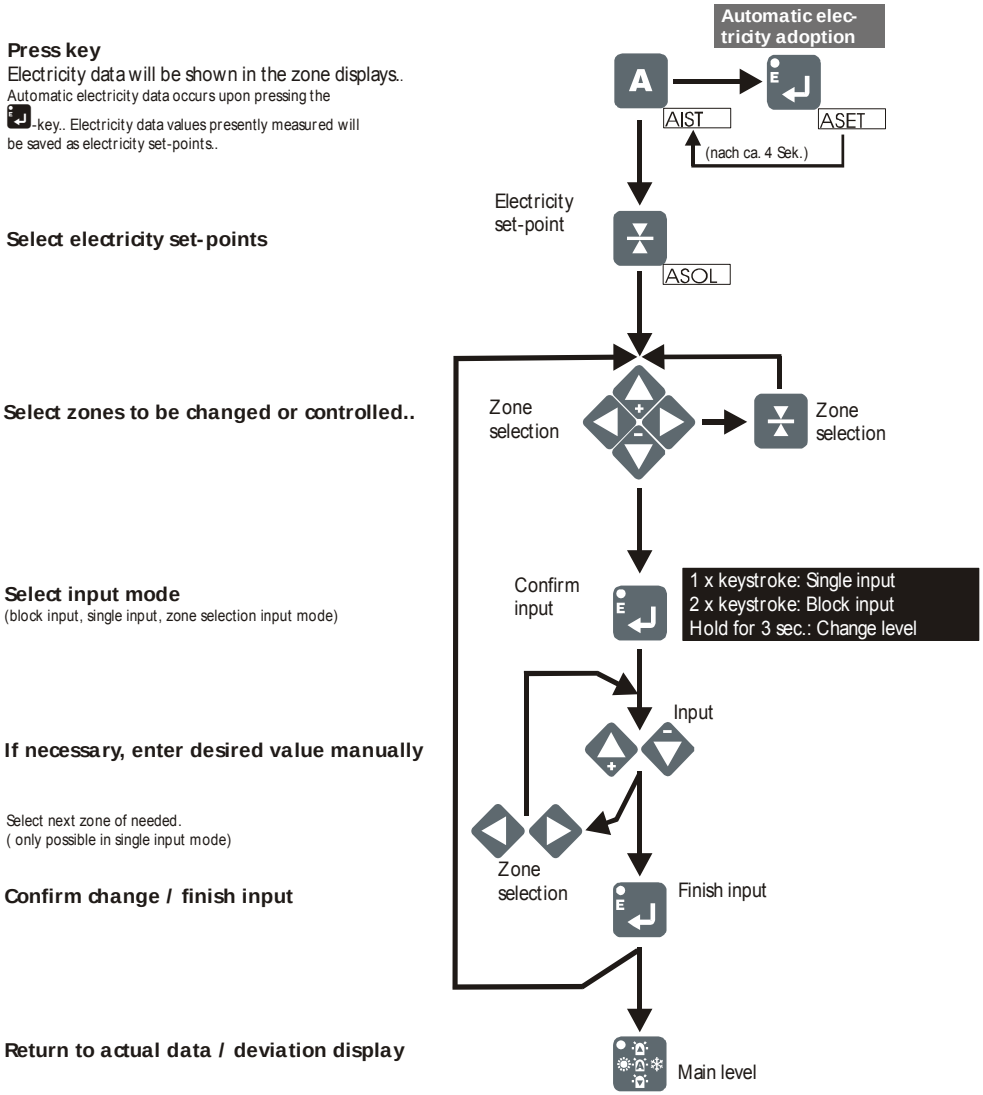
- **start up set-point (fixed to 100°C)**
- **boost set-point** 3SOL
- **lowering set-point** 2SOL

Only the main set-point can be altered through the hotkey ↵ / input function set-point change. All other set-points are changed through the respective parameter in the parameter memory.

Voltage adoption / change voltage set-point

The voltage set-point can either be measured automatically (through “automatic voltage adoption”) or be entered manually.

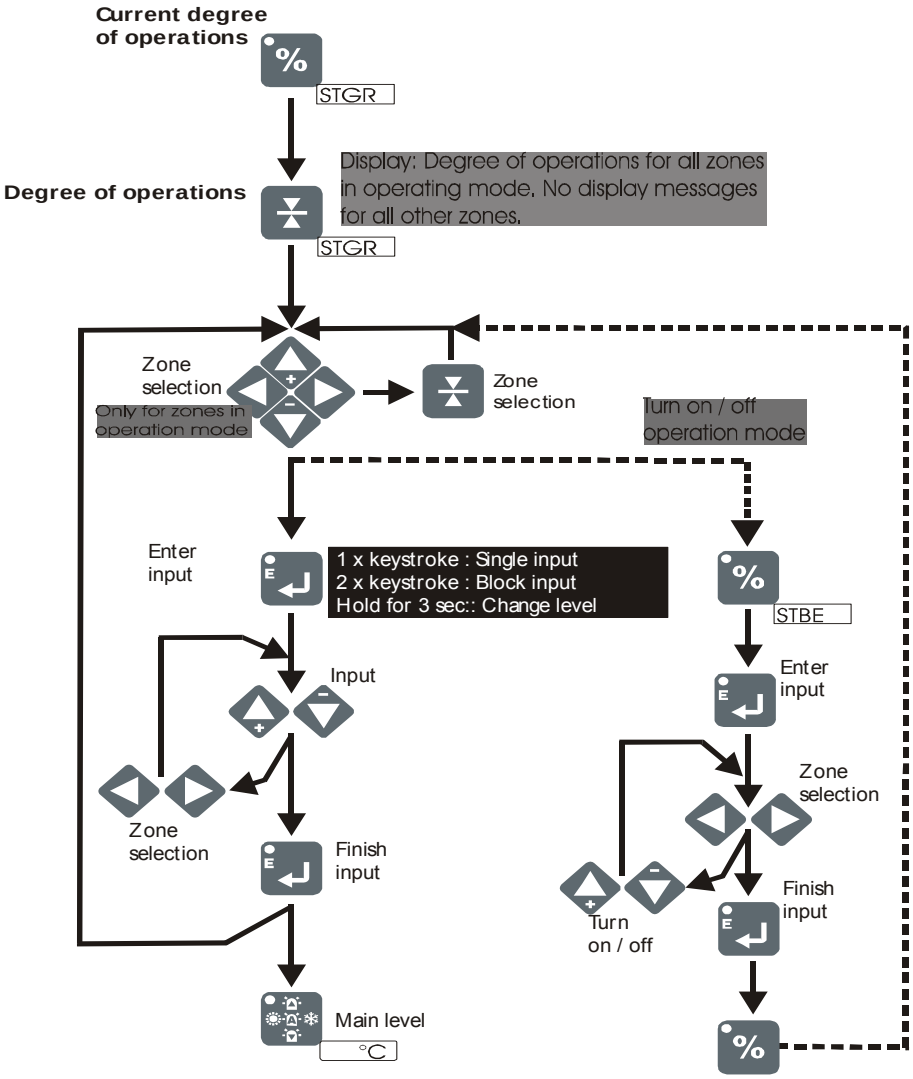
The “automatic voltage adoption” function saves actual voltage values as voltage set-points upon measuring.


Press key
Electricity data will be shown in the zone displays..
Automatic electricity data occurs upon pressing the -key.. Electricity data values presently measured will be saved as electricity set-points..
Automatic elec-tricity adoption
A
AIST
ASET
(nach ca. 4 Sek.)
Electricity set-point
ASOL
Select electricity set-points
Select zones to be changed or controlled..
Zone selection
Zone selection
Select input mode
(block input, single input, zone selection input mode)
Confirm input
1 x keystroke: Single input
2 x keystroke: Block input
Hold for 3 sec.: Change level
Input
If necessary, enter desired value manually
Select next zone of needed.
(only possible in single input mode)
Zone selection
Confirm change / finish input
Finish input
Return to actual data / deviation display
Main level

If the voltage set-point was measured by “automatic voltage adoption” it is not necessary to enter it manually.

Manual Mode

This function allows to continue running an operating zone manually even though its sensor is defective. When switching from regular operations to Stellerbetrieb the operating system automatically offers the most recently calculated degree of operation average measured prior to the defective sensor for adoption.



The degree of operation is a number between -100 and 100, stating the ratio of the operation's port engaged versus being disengaged in reference to the time elapsed during the measuring process.

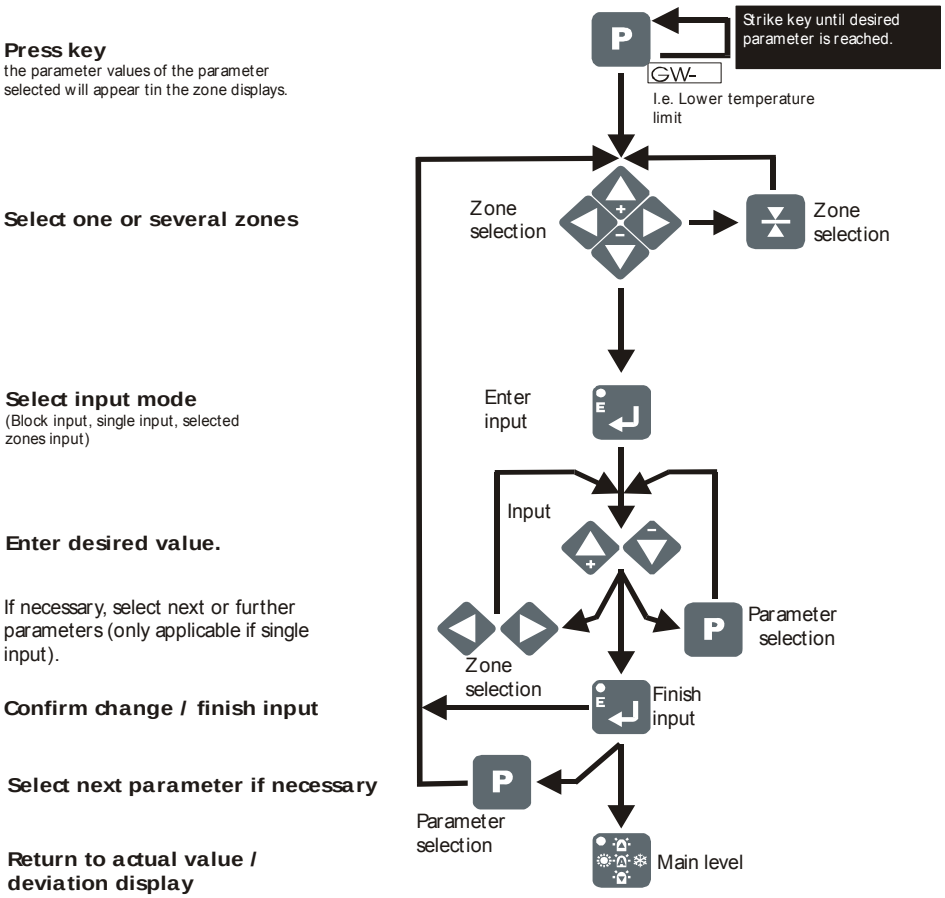
Example: Degree of Operation: 25%, Measuring process time: 4 seconds

The heating operation's port is engaged for 1 second during the measuring process.

Attention: Since a sensor can break during the heating process it is absolutely necessary to check the degree of operation also.

Zone specific parameters

All other zone specific configuration- and process parameters are saved in the parameter memory. Zone specific parameters are parameters for which an individual value may be entered in every zone.



Load / save set-point block

4 temperature set-point blocks for a maximum of all 32 zones (depending on the number of zones in the operating system) may be saved in the operation unit's memory. A set-point block is defined as one set-point per zone.

Load set-point block If this function is selected all set-points presently valid in their respective zones will be replaced by the set-points as they are saved in the set-point block memory.

Save set-point block If this function is selected all set-points presently valid will be saved in the set-point block memory. The data saved up to this point will be replaced.

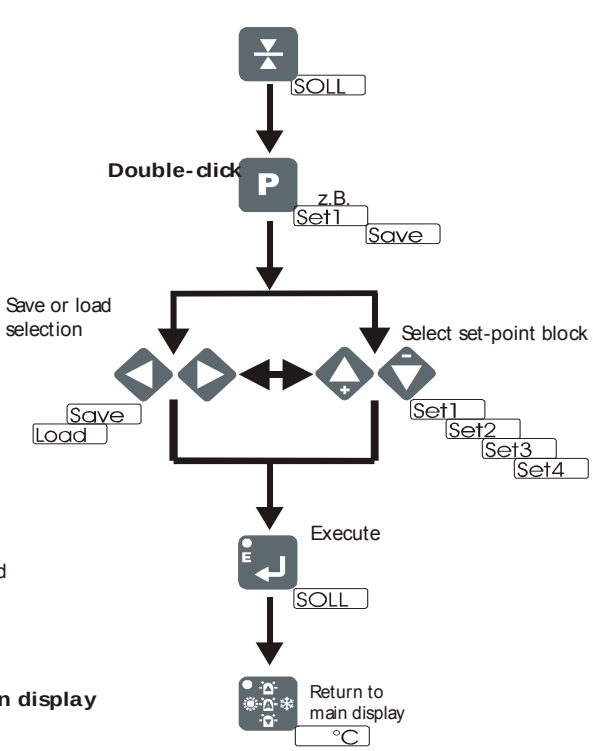
Press key
The current set-point block is shown in the zone displays.

Access set-point block function
The words **load** to load a set-point block and **save** to save a set-point block blink in the information display.

Select the desired set-point block as well as save / load functions.

Confirm input
The presently valid set-point is displayed again after loading or saving a set-point block.

Return to actual data / deviation display

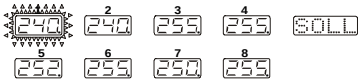


How to switch between actual value / deviation display

Either only actual data or set-point data can be displayed in the zone displays. Therefore, one has the option to switch between actual data and deviation data to be displayed in the main display.

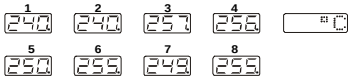
The advantage offered by the deviation display is that the operator notices operating conditions at first glance.

Set-points
i.e.

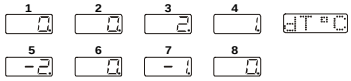


By pressing either of the two keys the main level display is changed from actual temperature values to deviation display.

Actual values
i.e.



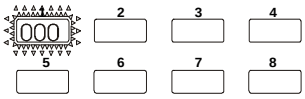
Deviation display
i.e.



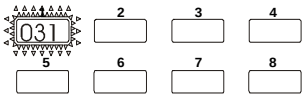
Entering a code number

Complex system or process specific functions can be initiated in all zones through code numbers, which make handling the system easier

Select code function



Select code
i.e. Code 31 to display operating temperatures in °F



Confirm selected code
The function will be executed.

Process Control Function

The process control function allows changes in the control process to be recognised quickly and reliably for every zone. These changes occur e.g. when the tool has a leak and splashes. The control behaviour is monitored for all control zones during production. If changed control behaviour is recognised, an alarm message is issued and PAL for process alarm is shown in the zone. The alarm message can be acknowledged. Once the cause of the changed control behaviour has been rectified, the alarm becomes active again immediately.

If however the control behaviour has changed significantly due to production reasons, the new process behaviour can be accepted by entering a code number.

The process control function is activated by the parameter PTOL for process tolerance. When the value is set to 000, the function is switched off. In the process tolerance parameter, settings are made to define how large the change in control behaviour can be before an alarm message is issued. Practical experience has shown that a setting of 010% is expedient for standard applications. After the start, Pro (process) is shown in each zone to indicate that process monitoring is active. Once the operating target value has been reached, the process monitoring is automatically activated after a learning phase. To indicate that the monitoring function is now active for this zone, Pro is no longer shown.

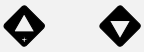
Activation of the Process Control Function

P	Press the parameter function key.	The last selected parameter is shown in the information display e.g. STGR of the regulation ratio.
P .. P PTOL	Keep pressing the parameter function key until the parameter PTOL is shown in the information display.	The value per zone for the process tolerance is shown in the zone displays.
▲ ▼	Enter the % value using the arrow keys.	010% is sufficient for standard applications.
◀ ▶ ▲ ▼	If necessary, select further zones and enter % value.	
E	Confirm entry and quit.	The process control function for this zone was activated by the input of a value >000%.

Acknowledgement of the Process Alarm

OUT	Press the status key; the current zone status is shown in the zone display.	The status of the zones is shown.
E	The alarm is acknowledged with the input/enter key.	The heating output is released. No more alarm messages will appear.
	Return to basic screen (actual value display).	The system automatically returns to the basic screen after approx. 180 seconds.

Accepting New Process Parameters

	Press both function keys and keep pressed until Code appears in the information display .	The code number 000 is displayed in a zone display
	Enter the code number 305 using the arrow keys.	350
	Confirm entry and quit.	The new process parameters are accepted for all zones.

Diagnosis function "Heating / sensor allocation"

A complex testing function to automatically check the "sensor / heating" allocation is built into the operating block. This function allows testing if sensors and heating are properly connected.

The function employs the configuration parameter ANF4 (start up time of the 4th set-point). A testing time is determined per individual zone. The testing time defines the time frame in which a zone is to respond to an incentive.

The testing pattern is initiated through code number 602.

It occurs in three phases:

Phase 1 **Defective sensor check**

During phase 1, the degrees of operation of

- **all active zones**
- **whose set-points are greater than 0°C**

are set to 0%.

If a damaged sensor is identified in the respective zones, the zone displays – if using the Operating and Display Unit BA – report an error message dF 1 and the testing pattern will be aborted entirely.

The respective information can be downloaded on the offset 0x60 through the port / bus port.

Phase 2 **Total check**

During phase 2 the set-points of

- **all active zones**
- **whose set-points are greater than 0°C**

are set to 0% for the duration of the testing time AFZ4 and the actual values are monitored. If using the Operating and Display Unit BA the message dI A appears in all zone displays.

If an actual value increases by at least 5°C during the testing time the respective zone display will read dF2 and the testing pattern will be aborted entirely.

Phase 3 **Single check**

Upon completing testing all zones each zone is tested individually. This occurs in sequence for each zone separately.

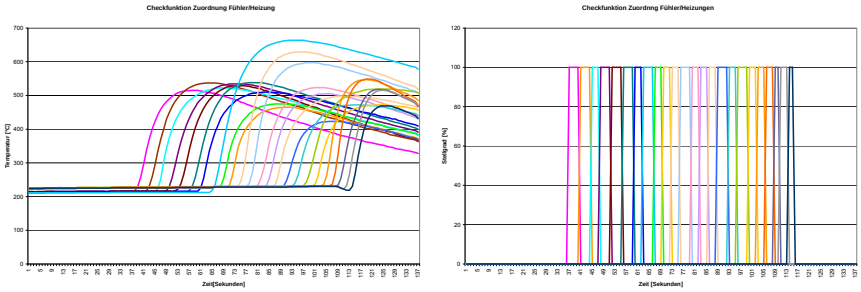
The degree of operation of one zone is set to 100% and actual values are monitored. The zone should respond with a temperature increase by 5°C within the testing time frame.

The following messages result from a single check:

Message	Meaning
dF3	No increase occurred during the testing time frame
dF 1	Sensor incorrectly connected
dF4	Actual values increased although no heating element was addressed (combined message with dF3)
dE	Zone o.k.

If an error occurs the zone displays relay an error message and the testing process is aborted.

The following graphs show the course of actual temperature values and the degrees of operation when running the diagnosis function for 24 zones.



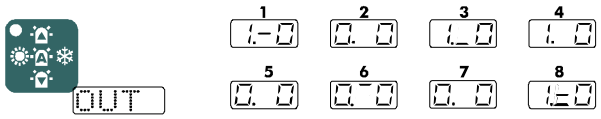
The testing process must be confirmed with code number 602 upon completing the cycle. The same code number aborts the testing process.

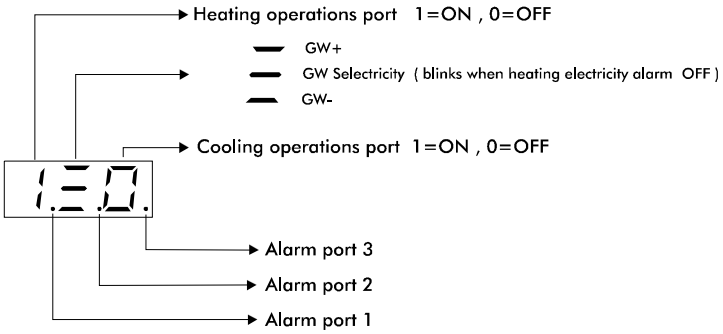
Operating conditions of the operating block

Status display

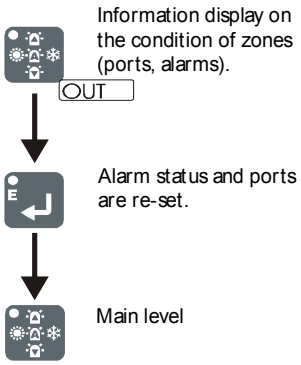
When pressing the status key during operations the zone displays will show information on the status of the operating zones. It contains information about

- **Temperature limit alarms,**
- **Electricity alarms,**
- **Alarm port status**
- **Operating port status**




Heating operations port 1=ON , 0=OFF
GW+
GW Selectricity (blinks when heating electricity alarm OFF)
GW-
Cooling operations port 1=ON , 0=OFF
Alarm port 3
Alarm port 2
Alarm port 1

Confirm alarm status / reset alarm ports



The alarm ports on the operating block can be set with a memory function. They remain active until they are confirmed and reset.

An alarm / alarm port is reset by pressing the edit / enter key in the status display.

Trouble shooting

System errors from the operating system

The operating system conducts a continuos self-scan. In the event of an error it relays a system error message over the Operating and Display Unit:

Err 002	Comparison error extension module
Err 003	Comparison error main module
Err 005	Error checksum in system datas
Err 008	Basic configuration has changed

In this case it is strongly recommended to return the operating unit to the manufacturer.

Chapter 5

Configuration parameters

The following chapter lists all configuration parameters in the HRS operating block system.

General hints

Manufacturer's settings

All parameters are set to standard parameters when the operating system is shipped.

Notice

The pre-configuration is adjusted to most common needs and is sufficient for most operating environments.
It may be necessary to optimize the settings.

Zone specific parameters

Parameter	Parameter description	Range	Unit
SOLL	Set-point	000...999	°C/°F
STLG	Degree of operation	-100...100	%
STBE	Stellerbetrieb		on/off
GW-	Limit -	000...999	°C/°F
GW+	Limit +	000...999	°C/°F
ATOL	Voltage tolerance	0,0...99,9	%
ASOL	Voltage set-point	0,0...99,9	A
2SOL	2nd set-point	000...999	°C/°F
3SOL	set-point boost function	000...999	°C/°F
ANFB	Start up mode		on/off
ANFZ	Start up time (Start up mode)	000...099	min
AFZ3	Start up time boost set-point	000...099	min
AFZ4	Testing time for diagnosis function	000...999	min
ANFZ	Time for diagnosis function	000...999	min
IDEN	Heating identification		on/off
TRMP	Temperature ramp	000...999	°C/min

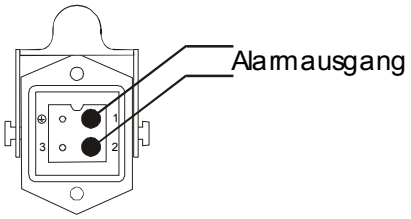
ARMP	Automatic temperature ramp		on/off
K-FZ	Amplification lead zone	0,1...2,0	
NrFZ	Number of lead zone	000...032	
ZONE	Zone active / passive		on/off

Plug settings

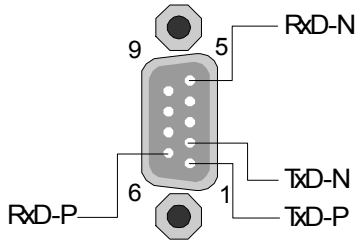
Out plug for heating and sensor

The pin assignment of the device please see technical documentation enclosed for the device.

Alarm report for upper and lower limits and voltage alarm



Port settings RS 485 (optional)



Declaration of Conformity

See following page.

EG-Konformitätserklärung
Declaration of Conformity

PSG Plastic Service GmbH
Pirnaer Strasse 12-16
68309 Mannheim
Germany

erklärt hiermit, dass die nachstehend beschriebenen Produkte
hereby declares, that the following products

Heißkanalregler	Hot runner controller
HRS	HRS

übereinstimmen mit den Bestimmungen folgender EG-Richtlinien
are in conformity with the following standards of the EC directives

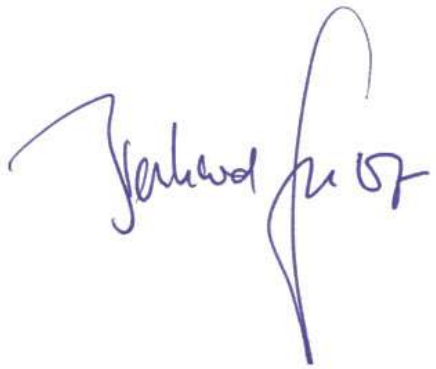
EMV-Richtlinie 2004/108/EG	EMC directive 2004/108/EC
Niederspannungsrichtlinie 2006/95/EG	Low voltage directive 2006/95/EC

Angewandte Normen und technische Spezifikationen
Applied standards and specifications

EN 60204-1	EN 60204-1

Mannheim, den 25.02.2010

Ort/Datum Place/Date



Bernhard Seelert, Produktmanager/Product Manager

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